



DIRECT SEEDING SCARLET OAK IN THE NORTH CAROLINA MOUNTAINS

Seedling establishment rates varied from 0 to 50 percent in a direct seeding study with scarlet oak (*Quercus coccinea* Muenchh.) on the Bent Creek Experimental Forest near Asheville, North Carolina. Acorns planted 2 inches deep in the spring with screen protection produced the most seedlings; those surface sown without screens in the spring or fall produced none.

This study is one in a series of similar studies made during the past 6 years in an effort to develop successful artificial regeneration methods for oaks. Other species used in the series were northern red oak and white oak. Results have been similar for the three species.

Treatments consisted of all combinations of surface seeding vs. planting 2 inches deep, screened spots vs. unscreened spots, and December 1962 planting vs. March 1963 planting. Thirty-two acorns spaced one foot apart in a row constituted a treatment plot. Treatments were replicated in seven randomized blocks on a cleared forest site.

Acorns were collected in October and handled carefully to preserve germination capacity. They were culled by visual inspection and by water immersion to separate light acorns, then treated 40 minutes in hot water at 120° F. to control weevils.

Table 1. --Survival in relation to planting depth, protection, and season of planting

| Depth | Protection | Season | Seedling establishment ¹ |
|----------|------------|--------|-------------------------------------|
| | | | Percent |
| 2 inches | Screens | Spring | 50.1 |
| | Screens | Fall | 37.1 |
| | No screens | Spring | 21.2 |
| | No screens | Fall | 17.7 |
| Surface | Screens | Spring | 0.4 |
| | Screens | Fall | 0.1 |
| | No screens | Fall | 0.0 |
| | No screens | Spring | 0.0 |

¹ Means not under a common bracket are significantly different at the 5-percent level (Duncan's New Multiple Range Test).

The selected acorns were stored in closed plastic containers in a refrigerator until planting or stratification. Acorns selected for spring planting were stratified in the ground below freeze level from early January until late March, when they were planted. Fall-planted acorns were not stratified prior to planting.

By July 3, 1963, one-half the acorns planted 2 inches deep in the spring with screen protection had produced established seedlings. Acorns surface sown in the fall or spring without screen protection failed to produce seedlings (table 1).

Seeding depth was the most important of the three factors studied. The average independent effect of planting 2 inches deep as opposed to surface seeding was to increase seedling establishment by 29 percent. Screen protection increased establishment by 2.3 percent, a significant amount. There were no consistent differences associated with seeding season.

Rodent depredation remains a serious factor limiting direct seeding as an artificial method for reproducing oaks. Mechanical protection of acorns is too expensive and added little to success in this study. Deep planting seems most promising for concealing acorns.

Earl R. Sluder
Division of Timber Management Research
Asheville, North Carolina